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EXAMINER

DHINGRA, RAKESH KUMAR

ART UNIT PAPER NUMBER

1763

DATE MAILED: 06/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/655,307

Applicant(s)

LEE, SHIN-SANG

Examiner

Rakesh K. Dhingra

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 9/5/03.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☒ Claim(s) 1 and 3 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 9/2003.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION

Claim 1 objected to because of the following informalities:

Line 7 of claim 1: it is suggested to insert "to" after "as".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 3 recites the limitation "said protrusion" in lines 1, 2 of claim 3. There is insufficient antecedent basis for this limitation in the claim. The claim should be corrected to read as "The apparatus of claim 2, wherein the flute extends to an end of said protrusion".

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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Claim 1, 3, 4, 5, 6 are rejected under 35 U.S.C. 103 (a) as being unpatentable over admitted prior art in view of Grimbergen et al (US patent No. 6,835,275 B1) and further in view of Kim et al (US Pub. No. 2002/0014203 A1).

Regarding Claim 1: admitted prior art teaches about a plasma etching apparatus comprising:

a processing chamber in which a plasma etching process is performed;

admitted prior art teaches a monitoring window of transparent material being disposed in a side wall of said processing chamber, but does not teach about flute in the monitoring window;

Grimbergen et al teach a plasma apparatus (Figure 1a, 1c, 5a) having a window 130 with groove (flute) 145, which is at an inner surface of the window and facing the interior of the processing chamber (column 5, lines 48-68).

Grimbergen further teaches that the groove 145 allows radiation to pass from the process chamber 35 and reduces the formation of process residues on window 130.

admitted prior art also teaches an optical detector mounted outside said processing chamber, but does not teach about the alignment of the flute of said monitoring window so as to detect a change in the process;

Grimbergen et al also teach that groove 145 allows radiation to pass therethrough to operate the process monitoring system 25 (radiation detector Figure 1c, lines 60-65).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use flute (groove) as taught by Grimbergen et al in the monitoring window

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apparatus per admitted prior art to reduce formation of process residues on the monitoring window.

admitted prior art in view of Grimbergen et al teach all limitation of claim except for heater.

Kim et al teach an apparatus (Figure 4a, 4b, 5, 6a, 6b) in which a heating element (heater) 60 is held close to window 30, so that polymer created during the process does not adhere to the window (pages 1 and 2, paragraph 0015). Kim et al further teach (Figure 4B) that warm air can be also used to provide heat within heat insulating member 50 (page 2, paragraph 0029 and page 3, paragraph 0034).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use heater as taught by Kim et al in the apparatus per admitted prior art and in view of Grimbergen et al, positioned relative to monitoring window to minimize adherence of polymer to the window.

Regarding Claim 3: Grimbergen et al teach that groove 145 may extend or terminate at window or other structures or devices in the chamber (column 5, lines 48-65).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use window with flute (groove) as taught by Grimbergen et al in the apparatus per admitted prior art in view of Kim et al to reduce formation of process residues on the monitoring window.

Claims 4, 5, 6: Admitted prior art in view of Kim et al teach limitation of claims except for polymer attracting device.

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Regarding claims 4, 5: Grimbergen et al teach about a mask 140 (Figures 3, 4, 5b) which may be part of chamber wall, or window or a separate structure that serves to reduce formation of process residues on the window 130 (column 8, lines 47-55).

Regarding claim 6: Grimbergen et al also teach about using mask 140 in combination with electrical field source 220 and electrode 225 to maintain an electrical field that may be adapted to reduce deposition of process residues on the wall or on the window (column 11, lines 20-46, lines 60-65).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use mask (polymer attracting device) along with electrostatic means as taught by Grimbergen et al in the apparatus per admitted prior art and in view of Kim et al, to reduce deposition of process residue on window.

Claim 2 is rejected under 35 U.S.C. 103 (a) as being unpatentable over admitted prior art in view of Grimbergen et al (US patent No. 6,835,275 B1) and Kim et al (US Pub. No. 2002/0014203 A1) as applied to claim 1 above, and further in view of Suk et al (US Patent No. 5,748,297).

Admitted prior art in view of Grimbergen et al and further in view of Kim et al teach all limitations of claim 2 except for monitoring window with protrusion.

Suk et al teach an apparatus (Figure 4) having a window 20 with a protrusion 22, which helps to prevent clouding of window 20 (column 3, lines 5- 20, lines 50-68 and column 4, lines 36-40). Suk et al also teach that various changes in form and details may be effected within the spirit and scope of the invention (column 4, lines 55-60).

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Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use window with protrusion as taught by Suk et al in the apparatus per admitted prior art and in view of Grimbergen et al and further in view of Kim et al to prevent clouding of window.

Claim 7 is rejected under 35 U.S.C. 103 (a) as being unpatentable over admitted prior art in view of Grimbergen et al (US patent No. 6,835,275 B1), Kim et al (US Pub. No. 2002/0014203 A1), Suk et al (US Patent No. 5,748,297) as applied to claim 4 above, and further in view of Yamada et al (Patent No. JP 60218846 A).

Admitted prior art in view of Grimbergen et al

Kim et al, Suk et al teach all limitation of claim except for polymer attracting device being a cooling device.

Yamada et al teach an apparatus (Figure 6) having a cooling trap 14 which absorbs reaction products before these reach light transmitting window 13 to enable detection of light to be performed with good reproducibility.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use a cooling device as polymer attracting device as taught by Yamada et al in the apparatus per admitted prior art and in view of Grimbergen et al, Kim et al, Suk et al, to enable light detection with good reproducibility.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

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Melvin et al (US Patent No. 6,306,246 B1) teach an apparatus (Figures 2, 3, 4) in which heated gas flow is maintained in contact with the windows 102, 108 of the dual port to prevent accretion of opaque material on optical part of process chamber 100.

Ebbing et al (US Patent No. 5,129,994) teach an apparatus (Figure 5) using selective heating of window surfaces adjacent one edge of the window 92 by heating means 100 and 110 to thereby form a cool region on the window surfaces adjacent the opposite edge of window whereby the center of the window will remain substantially free of polymer depositions (column 7, lines 15-25).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rakesh K. Dhingra whose telephone number is (571)-272-5959. The examiner can normally be reached on 8:30 -6:00 (Monday - Friday).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571)-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Rakesh K Dhingra



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